REMARKS

Claims 1-15 are currently pending in the Application. In an office action dated June 3, 2003 ("Office Action"), the Examiner rejected claims 1-15 under 35 U.S.C. § 102(b) as being anticipated by Yonetsu et al., U.S. Patent No. 6,506,513 ("Yonetsu"). Applicant's representative traverses these rejections.

In the current application, Applicant describes one embodiment of the present invention in paragraph [0016] as follows:

> In one embodiment, a <u>float is suspended</u> in a methanol-water solution contained in the anode reservoir, or a float chamber in fluid communication with the anode reservoir, and is visible through a transparent window. Normal operation of the fuel cell lowers the concentration of methanol in the methanol-water solution within the anode reservoir. As the concentration of methanol decreases, the density of the methanol-water solution increases. <u>The float, having a density intermediate between the density of water and methanol, continuously rises from a lower position to a higher position as methanol is consumed and the density of the methanol-water solution increases.</u> Thus, the position of the float corresponds to the concentration of methanol in the methanol-water solution. A fuel scale may be included to facilitate methanol concentration determination based on the float position in the methanol-water solution. (emphasis added)

Applicant illustrates the embodiment in Figure 2A, describing the illustration in paragraphs [0017-0019] as follows:

> Figure 2A illustrates one embodiment of the present invention with a density-based fuel indicator in direct contact with the anode reservoir. The anode reservoir 202 includes a long, thin vertical window 204 visible from the exterior of the fuel cell. A fuel scale 206, affixed to the exterior of the fuel cell, extends along the vertical length of the window 204. The fuel scale 206 is shown as a vertical line with a series of evenly spaced marks, each mark representing a fuel concentration.
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> <u>Figure 2A shows a float 208, suspended in fluid of a particular density, visible through a window 204 in the anode reservoir 202.</u> The float 208 utilizes a horizontal fuel indicator bar 210 to facilitate fuel concentration determination. The position of the fuel indicator bar 210 corresponds to a percentage of available fuel remaining. In Figure 2A, the position of the float 208 corresponds to a methanol concentration at which 87% of the available fuel supply remains.
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> <u>In the above-described embodiment, shown in Figure 2A, the float is contained directly inside the anode reservoir.</u> (emphasis added)

Finally, Applicant clearly claims, in claim 1:

> 1. A fuel cell comprising:
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> an anode where fuel is oxidized;

a cathode where oxygen is reduced;

an anode reservoir that contains a fuel solution and the anode; and

a float *responsive to fuel solution density* <u>immersed in a volume of fuel solution</u> that serves as a fuel-concentration indicator.

Please note that the claimed float is responsive to fuel solution density. It is responsive because, as stated in the above quote, has a density intermediate between, in the described embodiment, the density of water and the density of methanol. Therefore, the density of the float is less than that of water and greater than that of methanol. The float would sink to the bottom of the reservoir in pure methanol, and would rise to the top of the solution in the reservoir in pure water. That is why the lower extreme of the vertical window is marked "100%," while the top end of the vertical window is "0%." Methanol is the fuel for the fuel cell in the described embodiment. In general, in that embodiment, the fuel cell will contain neither pure methanol nor pure water, and the float will therefore be suspended in the fuel, between the bottom of the reservoir and the surface of the methanol/water solution within the fuel cell. The float is responsive to fuel solution density, as claimed, and not to the amount of fuel solution contained in the reservoir. The amount of fuel solution in the reservoir is not directly related to the amount of fuel in the reservoir. The reservoir may be full of water, but contain no fuel (methanol). Furthermore, claim 1 clearly claims a float immersed in a volume of fuel solution – not a float floating on the surface of the fuel solution. Floating on the surface and immersed in the solution are mutually exclusive states.

By contrast, Yonetsu discloses a float that is not at all responsive to fuel solution density, but that instead merely floats on the surface of the fuel. Yonetsu's float simply indicates the amount of solution within Yonetsu's fuel tank. Please consider the paragraph beginning on line 35 of column 12 of Yonetsu:

> It is also desirable to take some measure on the side of the fuel in order to facilitate confirmation of the remaining amount of the liquid fuel within the liquid fuel tank 1. To be more specific, the fuel can be colored with a substance that is not obstructive to the supply, vaporization and reaction of the liquid fuel. Inorganic or organic dyes, etc. can be considered as such a substance. <u>Alternatively, it is possible to add a solid material having a specific gravity lower than that of the liquid fuel, e.g. a polystyrene foam, to the liquid fuel as a floating material.</u> <u>*Since such a floating material 26 is always kept positioned on the surface of the liquid fuel as shown in FIG. 18*</u>, the remaining amount of

> the liquid fuel can be confirmed more easily by combining the floating material 26 with the liquid fuel tank 1 shown in FIG. 16 or 17. The material added to the liquid surface for detecting the surface of the liquid fuel is not limited to a solid material. It is also possible to use a liquid material such as a colored organic solvent or oil having a specific gravity lower than that of the liquid fuel.

Thus, Yonetsu does not disclose a fuel cell with "a float responsive to fuel solution density immersed in a volume of fuel solution that serves as a fuel-concentration indicator." Instead, Yonetsu's device measures the amount of liquid fuel in a tank by floating on the surface of the fuel. As the quantity of liquid fuel decreases, the float is lowered within the tank. By contrast, Applicant's float, responding to solution density, rather than the amount of solution, and actually rises to the top of the tank when the methanol fuel in a methanol/water fuel cell is exhausted. Applicant's dependent claims 2-9, depending from claim 1, are not anticipated by Yonetsu, for the same reason that claim 1 is not anticipated. Applicant's method claims include language similar to claim 1, and are directed to a method for measuring fuel solution density, in turn indicative of the amount of fuel contained in a solution within a reservoir in contrast to Yonetsu's floating device for measuring the amount of solution.

All of the claims remaining in the application are now clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

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